

Atmospheric Infrared Sounder

Instrument Operations Status

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September 26, 2006

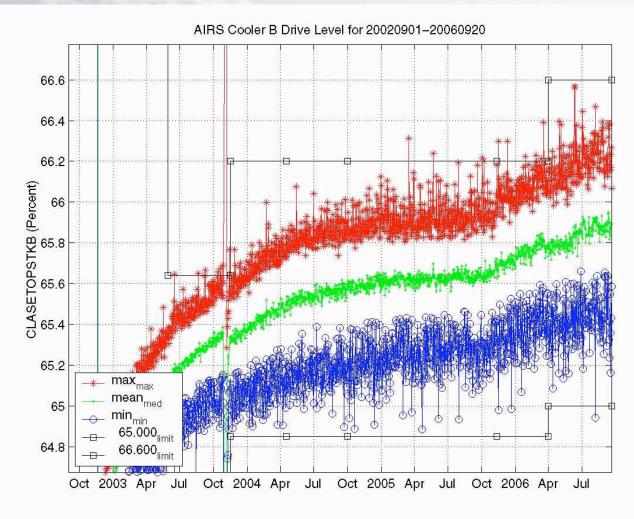


AIRS—General

- The instrument is very healthy
 - No significant trends in any temperatures, currents, or voltages
 - Cooler B active drive level has been <u>very slowly</u> rising for the last year
 - The rate is extremely slow, 0.3% per year, and not a cause for concern
 - Chopper drive current
 - Peaked at 11.13 mA in April, 2005
 - Slowly declined until reaching a minimum of 10.64 mA around September 1, 2006—a value this low was last seen in early December, 2003
 - It is now slowly rising (daily mean for September 13 was 10.65 mA)
 - This may be a cyclical process—cause not understood
 - Yellow alarm limit is 40 mA, so we are NOT in a danger zone

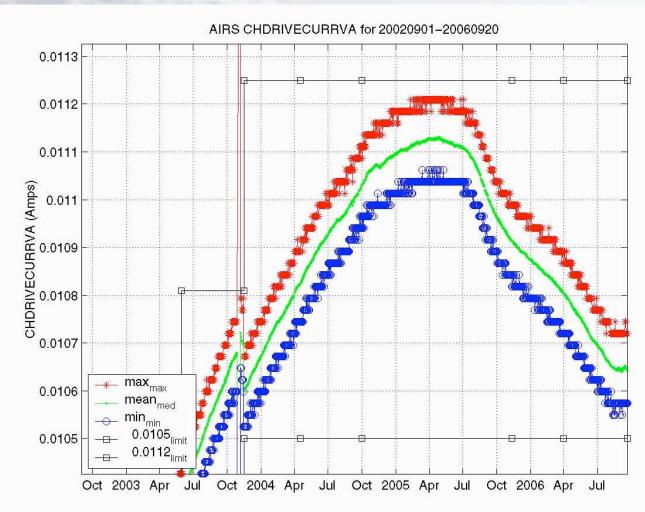


Cooler B Drive Level





Chopper Drive Current





AIRS—IR Channels

- Every so often a channel's NEΔT increases significantly due to a radiation event (usually in the SAA or the polar horns) or a steady build up of charge
 - Sometimes such channels recover on their own
 - An instrument thermal cycle can cause some detectors to recover while others become noisy
 - These noisy detectors are not dead and not useless—just noisier than spec
 - The criterion to be considered noisy in this sense is "more than 10 granules per day are flagged"
- Present status of channels which were in good condition at launch
 - 50 detectors are now classified as "noisy"
 - In about half of these cases, only the A side or only the B side is noisy

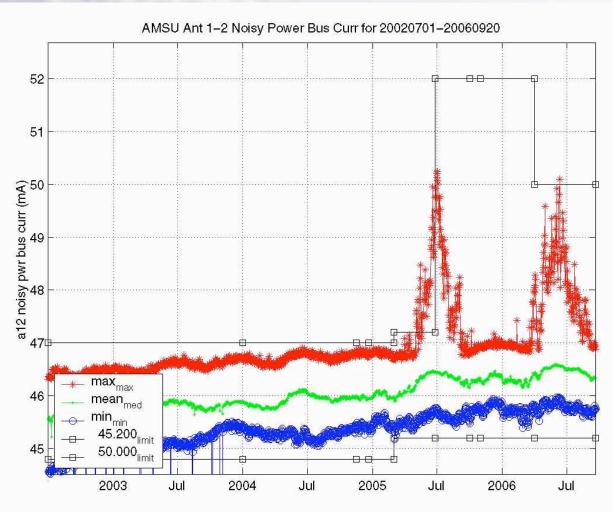


AMSU-A

- Healthy—all temperatures, voltages, and currents as expected
- No significant long-term trends in currents, temperatures, or voltages
- The second episode of higher-than-usual current in the A1-2 noisy bus recently ended
 - During the event the current rises several mA each orbit, near the south pole, then falls
 - Daily averages tend to peak shortly after the solstice (start of winter in southern hemisphere)



AMSU-A1-2 Noisy Bus Current





Aqua Spacecraft Status (1 of 2)

- Aqua is generally healthy
- Four anomalies (three related to the power generation and batteries) have occurred, but there has been no impact on operations
 - Solar array drive assembly potentiometer has occasional anomalies
 - ARE 4A power drop on September 9 2004 (recovered October 8 2004)
 - Battery Module Assembly #2 Cell #4 overheated on 9/2/2005—there have been occasional anomalies in the same cell since, most recently on January 23
 - Final closeout report issued in March 2006—root cause unknown



Aqua Spacecraft Status (2 of 2)

- Since April 2006 there have been intermittent increases in the single-bit error rate in one sub-module of the solid state recorder
 - The SSR has built-in error detection and correction which can fix any single-bit error
 - There has been no increase in the double-bit error rate



Aqua Spacecraft Fuel Consumption (1 of 3)

- Given current trends, the primary life-limiting resource is fuel for maneuvers
 - 225 kg fuel on board at launch
 - The required re-entry reserve is unclear, but a worst case amount of 125 kg is now being carried
 - Thus, 100 kg were available at start of mission, with much more available if the re-entry reserve requirement can be relaxed
 - Prior to the current series of inclination adjustments we had used about 46 kg
 - About 20 were used in post-launch orbit adjustments
 - About 15 were used in a series of inclination adjustments in fall 2004
 - About 11 have been used in all the drag make up burns to date

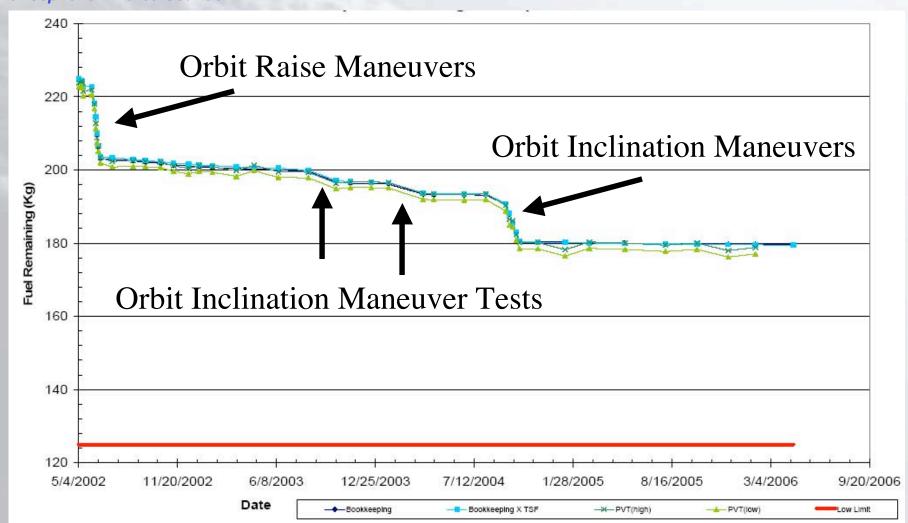


Aqua Spacecraft Fuel Consumption (2 of 3)

- Fuel consumption for the present inclination adjustment series is not yet available
 - The series of six planned maneuvers in August–September 2006 was stopped after four
 - But a previously unplanned set is now being considered for spring 2007
- The Earth Science Mission Operations Flight Dynamics unit at GSFC estimates that, given current usage patterns and plans, Aqua has enough fuel to last at least through 2015
- That estimate assumes a re-entry reserve of 125 kg,
 which may be higher than will actually be required



Aqua Spacecraft Fuel Consumption (3 of 3)





BACKUP

BACKUP



Radiation Circumvention Hits

